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An octagonal box has a pleasing symmetry, and is a satisfying test of your woodworking skills. Here's how to make one... or two!

Figure of eight

Making an eight-sided box isn't that much more difficult than making a four-sided one. The only differences are that the angles are set at 67·5° instead of the easier 45°, and that there are more pieces to be assembled. You need to take just as much care when cutting the various parts, but using a specific router cutter makes this stage much quicker and easier.

As for the choice of timber, this really is a matter of personal preference. So little timber is required that this is a good way of using up offcuts of timber and leftover veneers. For the example shown in this project, I used some Canadian maple with a piece of birds'-eye maple veneer for the top. I added some thin black stringing. The second box pictured is identical in size, but is made from oak with purpleheart banding.

The materials you'll need

The timber used for the project should, ideally, be cut from one piece of timber to ensure grain continuity. For this box you'll need about 600mm of wood 80mm wide and 8mm thick, a similar length of 50 x 4mm wood for the box lining, and two 150mm square pieces of 6mm plywood for the base and lid. Add a piece of veneer of your choice for the box lid, some trimmings for the stringing and some baize to line the box and cover the base.

Laying the veneer

Before starting work on the box sides, lay the veneer to be used for the box lid onto a piece of 6mm plywood cut a little oversize. An effective method of achieving this is to apply adhesive evenly to the plywood using a wallpaper seam roller, and then to sandwich the veneer and plywood between two carpet tiles and offcuts of chipboard. The carpet tiles are effective in following the slight contours and ensuring an effective bond. The clamps should be tightened evenly around the perimeter of the chipboard and the assembly allowed to dry thoroughly.

Preparing the parts

Mark out the position of the saw cuts on the timber, allowing a few millimetres between the components, and lightly number each piece in sequence. This will enable the grain to flow through the sides of the box (apart from the join between the first and last piece).

Fit a straight fluted cutter to the router table and set the depth of cut to 4mm. Position the cutter to cut the rebate to the thickness of the plywood top including the veneer, **photo 1**.

Set the table on the bandsaw to approximately 22·5° and cut the eight components from the timber. Cut between the lines previously drawn, **photo 2**, and remember which way the slope is to go on each piece.

Accurate bevels

For a box such as this to be successful, it's important that each of the eight components is identical in size. The easiest way of ensuring this is to make a template. An offcut of 9mm MDF is ideal; cut this to the exact width of the box side – in this

1 Cut a rebate on the timber to match the thickness of the veneered plywood

2 Use the bandsaw to cut the components slightly oversize

3 Trim the bevels using a router cutter. Note that the finger guard has been raised for clarity

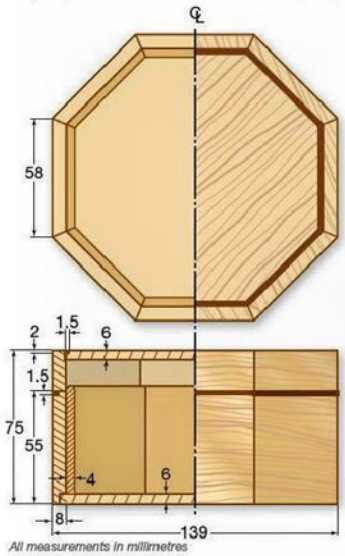
4 Lay the eight pieces in line against a straightedge and join them with masking tape

5 Use a protractor to divide the base into eight equal segments

6 Carefully draw around the inside of the box rebate to mark the base

case, 58mm. Check that the sides are parallel and secure it to the first box side piece using double-sided tape.

Secure the cutter in the router table and set the depth of cut so the cutter will just cut the top of the maple but not the template. Position the fence so it's level with the front face of the bearing, **photo 3**. Using the sliding fence for support, slide the timber across the cutter. Most of the timber has already been removed using the bandsaw, so the cutter is only being used to trim the timber to the correct bevel. Note the use of the timber attachment to the sliding fence to prevent any breakout. The finger guard has been raised for clarity only.



All measurements in millimetres

Trial assembly

Lay all eight pieces face up and in numerical order against a straightedge, and stick them together with masking tape, **photo 4**. Butt each piece tightly against its neighbour as the tape is applied. Now fold the eight parts into an octagon and join the loose ends together.

Take the piece of plywood for the base and use both a square and a small protractor to mark eight segments on it, **photo 5**. Draw these lines clearly and accurately using a sharp pencil. Now take the joined-up box, place this on the base and adjust its position so that each dividing line passes through the join of each segment of the box. When you're satisfied, use a sharp pencil to trace around the inner edge of the rebates to mark the outline of the base onto the plywood, **photo 6**.

Cut this base out carefully to make an accurate octagon. I find the easiest way of doing this is to use a bearing-guided trimmer running against a straightedge held onto the plywood with double-sided tape. Use the base as a template to cut the lid, **photo 7**, again with a bearing-guided trimmer. Put a small pencil reference mark on both the base and the lid so that, on assembly, the lid and base will correlate if the octagon is slightly out on one edge.

Adding the details

Canadian maple is a very pale timber, and to contrast the pale sides with the bird's-eye maple veneer I glued some black stringing into a rebate cut around the perimeter of the lid. This is cut using either a straight cutter with the fence accurately set on the table, or, as I prefer, using a bearing-guided trimmer with a smaller bearing on the end.

When it comes to sanding the veneer smooth with the inlay, there's a tendency for the black dust to smudge into the pale veneer and ruin it. This can be avoided if the veneer is first sealed with a couple of coats of pale polish before the stringing is glued in place. Use pieces of masking tape to hold the stringing in place until the adhesive has set, **photo 8**.

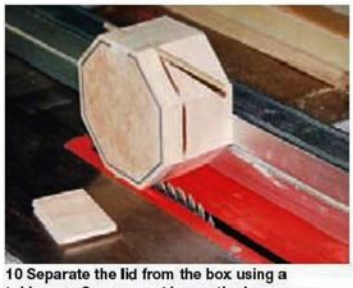
Assembling the box

Unroll the eight sides and apply a little adhesive into the bevels, including the ends.

7 Use the base as a template to make the lid

8 Secure the stringing in rebates cut into the lid

9 Glue the eight sides around the base and lid of the box



10 Separate the lid from the box using a table saw. Scrap wood keeps the box square

11 Cut a shallow rebate around the perimeter of the box base for some stringing

12 Set the disc sander table accurately to 22.5° using a sliding bevel

13 Bevel the edges of the lining pieces to fit inside of the box

14 Fit the baize inside the base and replace the eight lining pieces

Apply a small bead of adhesive along both the upper and lower rebates and wrap the sides around the top and base of the box, **photo 9**, securing the two ends with tape. Pull this tight and allow the adhesive to dry.

Splitting the box

This is always a nerve-wracking stage, but if care is taken the job is completed quickly and easily. Personally I set the depth of cut on my table saw to a whisker lower than thickness of the box sides, using an offcut from the assembly stage as a test piece. Secure the fence in place and slide the box against the fence. Then rotate it face by face to repeat the cuts. Fit some scrap timber in place in the top cut to stop the box wobbling as you cut the final sides, **photo 10**.

As can be seen, the guard and riving knife must be removed to allow the box to pass over the revolving blade, and it goes without saying that particular caution should be taken at this stage to keep your fingers away from the blade. If you don't have a table saw, you can cut the box using a router table or a handsaw.

Finally, lay some abrasive paper on a flat surface and smooth the saw cuts by rubbing the lid and base in a circular fashion on the paper. Avoid rubbing backwards and forwards, as this tends to chamfer the edges and the two parts will then not fit together accurately.

Fitting the interior

In a similar fashion to the lid, cut a small rebate along the top outer edge of the base, **photo 11**, and glue some more stringing in place after sealing the maple with polish.

To prevent the lid from sliding off the base, fit the interior with a lining that protrudes from the top of the base by about 5mm. These are cut from a strip of maple planed to 4mm thickness and bevelled slightly along its the top edge.

To cut these eight pieces accurately using the router would be a little tricky, owing to the thinness of the timber and the size of the cutter. However, a method that works well is to use a disc sander.

Firstly set the bevel to 22·5° using a sliding bevel, **photo 12**, and at the same time check the sliding fence is square to the disc. In a similar method to the cutting the exterior of the box, cut the lining pieces in consecutive order so the grain flows through them.

Cut the first piece to fit and clamp this in place on the inside of the box. Now bevel one end of the next piece, **photo 13**, and butt this against the piece just fitted. Using a marking knife, make a small square mark where the bevel should be for this second piece. Use the sander to bevel the edge to the score line. To stop the wood burning or charring on the sander, slide it across the disc using the fence as a support.

Repeat this process for all eight pieces. The final piece should be a tight fit, **photo 14**, as this holds all the other pieces together in place without the need for adhesive.

Completing the box

Remove the lining pieces and glue a piece of baize to the inside base of the box. This allows the lining pieces to sit over the cut edges of the baize and makes for a neater look.

The finish I used was a clear cellulose-based sealer brushed on with a polishing mop. I allowed it to dry before rubbing it smooth with a fine abrasive pad.

To finish your box, add a small knob on the lid if you wish, and glue some baize to the base of the box.